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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/643,483	08/19/2003	Donald H. Powers	88-2045A	5431
24114	7590	02/16/2006	EXAMINER	
LYONDELL CHEMICAL COMPANY			GRIFFIN, WALTER DEAN	
3801 WEST CHESTER PIKE			ART UNIT	
NEWTOWN SQUARE, PA 19073			PAPER NUMBER	
			1764	

DATE MAILED: 02/16/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

**Office Action Summary**

Application No.

10/643,483

Applicant(s)

POWERS ET AL.

Examiner

Walter D. Griffin

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 20 August 2003.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-15 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-15 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 13 January 2004 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- |                                                                                                                                             |                                                                                         |
|---------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)                                                                 | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                                                        | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)             |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date <u>111903</u> . | 6) <input type="checkbox"/> Other: _____                                                |

## DETAILED ACTION

### *Claim Rejections - 35 USC § 112*

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claim 15 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 15 is indefinite because the expression "said mixed isooctanes" lacks proper antecedent basis in claim 12. It appears as if claim 15 should depend on claim 14.

### *Claim Rejections - 35 USC § 103*

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

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This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

Claims 1-12 are rejected under 35 U.S.C. 103(a) as being unpatentable over Commereuc et al. (US 6,743,958 B2).

The Commereuc reference discloses a process for producing propylene. The process comprises providing a C4 stream that contains isobutene, n-butenes, butanes, and butadiene and then selectively hydrogenating the diolefins and acetylenic impurities in the stream along with isomerization of butene-1 in a first zone to produce an effluent that contains butanes-2 and isobutene. The catalyst used in this first zone contains a metal such as platinum on a support. Conditions used in the first zone include temperatures ranging from 0° to 200°C, pressures ranging from 0.1 to 5 MPa, and a space velocity ranging from 0.5 to 20 hr<sup>-1</sup>. The butene-2 stream is then passed along with ethylene to a metathesis zone to obtain an effluent that contains propylene. Conditions used in the metathesis zone include temperatures ranging from 0° to 200°C and pressures at least equal to the vapor pressure of the reaction mixture. The catalyst used in the metathesis zone comprises an oxide of a metal such as molybdenum or rhenium on a support. The reference also discloses the purging of the isobutane from the process and discloses that the product from the metathesis zone is separated to recover propylene and unconverted C4 hydrocarbons. These C4 hydrocarbons that are equivalent to the claimed third mixture are then recycled. See column 1, lines 38-44 and 65-67; column 2, lines 1-23 and 36-62; column 3, lines

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15-24 and 32-45; column 4, lines 64-67; column 5, lines 1-4 and 33-37; and column 6, lines 56-59; and column 8, lines 29-32.

The Commereuc reference does not disclose passing the recovered C4 hydrocarbons from the metathesis zone to a skeletal isomerization zone to form a fourth mixture that is then returned to the first and/or metathesis zone.

It would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the process of Commereuc by passing unconverted C4 hydrocarbons that are equivalent to the claimed third mixture to a skeletal isomerization zone to form a fourth mixture that is then returned to the first and/or metathesis zone because, as shown by Commereuc, a propylene effluent from a metathesis zone commonly contains other components such as C4 hydrocarbons. These C4 hydrocarbons are known to be the feed to the Commereuc process. Additionally, the Commereuc reference discloses that C4 hydrocarbons recovered in the disclosed process, although at a different point than claimed, can be skeletally isomerized to produce more of the desired C4 butenes used as feed to the process. Therefore, from this teaching, one would realize that C4 hydrocarbons recovered from the metathesis zone effluent could be isomerized to produce more feed to the process. One would then return this isomerized product to the process at any point upstream of the metathesis zone or to the metathesis zone in order to increase production of the desired propylene product.

Claims 13-15 are rejected under 35 U.S.C. 103(a) as being unpatentable over Commereuc et al. (US 6,743,958 B2) as applied to claim 10 above, and further in view of Leffer (US 2,401,649).

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As discussed above, the Commereuc reference does not disclose using a purge stream in an alkylation zone to form isooctanes.

The Leffer reference discloses that C4 hydrocarbons are conventionally alkylated to produce isooctane. See column 10, lines 16-23.

It would have been obvious to one having ordinary skill in the art at the time the invention was made to have modified process of Commereuc by purging some of the C4 hydrocarbons from the propylene production process and then alkylating these hydrocarbons as suggested by Leffer because valuable, gasoline range hydrocarbons will result.

### *Conclusion*

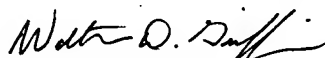
The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. The Gartside reference discloses a metathesis process that produces propylene.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Walter D. Griffin whose telephone number is (571) 272-1447. The examiner can normally be reached on M-F 6:30 to 4:00 with alternate Fridays off.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Glenn Caldarola can be reached on (571) 272-1444. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



Walter D. Griffin  
Primary Examiner  
Art Unit 1764

WG

February 14, 2006